AUTHOR INDEX

Allison, F. E. Nitrogen Fixation by Living Organisms (book review), 169.

Allison, Ira S. The Geology and Water Resources of Northwestern Minnesota (book review), 173.

Alway, F. J., and Kittredge, Joseph. The forest floor under stands of aspen and paper birch, 307–312.

Ames, J. W., and Kitsuta, K. Assimilation of phosphorus and potassium by barley plants grown according to Neubauer procedure and in undiluted soil, 197–207.

Baldwin, Ira Lawrence. *See* **Fred, Edwin Broun,** and McCoy, Elizabeth.

Ball, F. K. *See* **Emmert, E. M.**

Bhattacharya, A. K. *See* **Dhar, N. R.,** and Biswas, N. N.

Biswas, N. N. *See* **Dhar, N. R.,** Bhattacharya, A. K., and.

Blair, A. W., and Prince, A. L. Influence of organic matter on crop yield and on carbon-nitrogen ratio and nitrate formation in the soil, 209–219.

Brown, P. E. *See* **Smith, F. B.**

Clark, Cyrus L. The dispersion of soil-forming aggregates, 291–294.

Curtis, Harry A. (Editor). Fixed Nitrogen (book review), 168–169.

Curtis, Harry A. I. General Survey of the Sources and Utilization of Fixed Nitrogen. II. The Chilean Nitrate Industry. III. Fixed Nitrogen Recovered in Coal Carbonization. IV. A History of Nitrogen Fixation Processes (book review), 169.

Dhar, N. R., Bhattacharya, A. K., and Biswas, N. N. Photonitrification in soil, 281–284.

Dilley, J. R., and Edwards, W. L. High Pressure Equipment and Technic (book review), 169.

Drachev, S. M. Solubility of the solid phase of soil in water, 75–83.

Edwards, W. L. *See* **Dilley, J. R.**

Emmert, E. M, and Ball, F. K. The effect of soil moisture on the availability of nitrate, phosphate, and potassium to the tomato plant, 295–306.

Emmett, P. H. Synthetic Ammonia (book review), 169.

Fred, E. B. *See* **Mehlich, A.,** Truog, E., and; *see* **Wilson, P. W,** and Salmon, M. R.

Fred, Edwin Broun, Baldwin, Ira Lawrence, and McCoy, Elizabeth. Root Nodule Bacteria (book review), 167–168.

Fuller, James E. The influence of legume versus non-legume crops on the microbiological activities in the soil: II. Nitrification and cellulose decomposition, 485–491.

Gilbert, Basil E., and Pember, Frederick R. Influence of rye and oat straw upon the growth and yield of certain vegetables, 115–122.

Gittel, Erna B. H. *See* **Godfrey, G. H.,** Oliveira, Juliette, and.

Godfrey, G. H, and Hagan, H. R. Influence of soil hydrogen-ion concentration on infection by Heterodera radicicola (Greeff) Müller, 175–184.

Godfrey, G. H., Oliveira, Juliette, and Gittel, Erna B. H. The duration of life of the root knot nematode, Heterodera radicicola, in soils subjected to drying, 185–195.

Guernsey, E. W. The Alkali Cyanide Method of Nitrogen Fixation (book review), 169.

Hagan, Harold R. Comparison in the distribution of nematode galls on the roots of pineapple varieties attacked by the nematode Heterodera radicicola (Greeff) Müller, 29–42; *see* **Godfrey, G. H.**

Harper, Horace J. The easily soluble phosphorus content of soil as determined by electrodialysis, extraction with dilute acid solutions, and crop response to fertilization, 1–16.

Hibbard, P. L. Estimation of plant available phosphate in soil, 17–28.

Howard, P. E. Nitrogen Statistics (book review), 169.

Joffe, J. S. Lysimeter studies: II. The movement and translocation of soil

constituents in the soil profile, 239–257; III. The movement and translocation of nitrogen and organic constituents in the profile of a podzolic soil, 401–411.

Joffe, J. S., and Watson, C. W. Soil profile studies: V. Mature podzols, 313–331.

Kenny, William R. *See* **La Motte, Frank L.,** and Reed, Allen B.

Kitsuta, K. *See* **Ames, J. W.**

Kittredge, Joseph. *See* **Alway, F. J.**

Krase, H. J. The Cyanamide Method of Nitrogen Fixation. Synthesis of Urea; Oxidation of Ammonia (book review), 169.

Krase, Norman W. The Arc Method of Nitrogen Fixation (book review), 169.

Kunsman, C. H. Physical Methods of Studying Chemically Active State of Gases and of Investigating Catalyst Surfaces (book review), 169.

La Motte, Frank L., Kenny, William R., and Reed, Allen B. pH and Its Practical Applications (book review), 172.

Lemmermann, O. (Editor). Methoden für die Untersuchung der Bodens (book review), 169.

Lohse, H. W., and Ruhnke, G. N. Studies on readily available phosphate in soils: I. Extraction of readily soluble phosphate from soils by means of dilute acid potassium sulfate ($KHSO_4$), 437–457; II. The vertical distribution of readily soluble phosphate in some representative Ontario soils, 459–468.

McCoy, Elizabeth. *See* **Fred, Edwin Broun,** Baldwin, Ira Lawrence, and.

McHargue, J. S., and Young, D. W. The iodine content of the soil in Kentucky, 425–435.

MacIntire, W. H., Young, J. B., and Shaw, W. M. Base interchange induced by calcium, magnesium, and sodium nitrates in a 6-foot column of soil-subsoil, 49–53.

Mail, G. Allen. A soil temperature installation, 285–289.

Mallery, T. D. *See* **Shreve, Forest.**

Mehlich, A., Truog, E., and Fred, E. B. The Aspergillus niger method of measuring available potassium in soil, 259–279.

Merz, Albert R. *See* **Ross, William H.**

Muller, J. F. Some observations on base exchange in organic materials, 229–237.

Oliveira, Juliette. *See* **Godfrey, G. H.,** and Gittel, Erna B. H.

Patrick, Austin L. Influence of crop residue decay on soil nitrates, 335–354.

Pember, Frederick R. *See* **Gilbert, Basil E.**

Peterson, W. H. *See* **Wilson, P. W.,** Wenck, P., and.

Potapov, A. I. Soil acidity as a phytopedological factor, 55–73.

Powers, W. L., and Teeter, T. A. H. Land Drainage (book review), 170.

Prince, A. L. *See* **Blair, A. W.**

Reed, Allen B. *See* **La Motte, Frank L.,** Kenny, William R., and.

Robinson, Gilbert Wooding. Soils, Their Origin, Constitution, and Classification (book review), 171–172.

Ross, William H., and Merz, Albert R. Synthetic Nitrogen Fertilizers (book review), 169.

Ruhnke, G. N. *See* **Lohse, H. W.**

Salmon, M. R. *See* **Wilson, P. W.,** Fred, E. B., and.

Schmitt, Ludwig. Der Einfluss der Handelsdünger auf das Pflanzenwachstum und auf verschiedene Eigenschaften Kalkarmer Mineralböden (book review), 171.

Sessions, A. C., and Shive, J. W. The effect of culture solutions on growth and nitrogen fractions of oat plants at different stages of their development, 355–374.

Shaw, W. M. *See* **MacIntire, W. H.,** Young, J. B., and.

Shive, J. W. *See* **Sessions, A. C.; Stahl, A. L.**

Shreve, Forest, and Mallery, T. D. The relation of caliche to desert plants, 99–113.

Shrikhande, J. G. The degree of humification in manure measured by the use of hydrogen peroxide, 221–228.

Smith, F. B., and Brown, P. E. The diffusion of carbon dioxide through soils, 413–423.

Snyder, E. F. The electrometric determination of chlorides in soils by the silver-silver chloride electrode, 43–48.

Stahl, A. L., and Shive, J. W. Studies on nitrogen absorption from culture solutions: I. Oats, 375–399; II. Buckwheat, 469–483.

Teeter, T. A. H. *See* **Powers, W. L.**

Truog, E. *See* **Mehlich, A.,** and Fred, E. B.

Vageler, P. Der Kationen und Wasserhaushalt des Mineralbodens (book review), 173.

Van Slyke, L. L. Fertilizers and Crop Production (book review), 171.

Ward, Ritchie R. The colorimetric determination of phosphorus in citric acid extracts of soil, 85–97.

Watson, C. W. *See* **Joffe, J. S.**

Wenck P. *See* **Wilson, P. W.,** and Peterson, W. H.

Wiebe, Richard. Some Physical Properties of Hydrogen, Nitrogen, Methane, Ammonia, Carbon Monoxide and Carbon Dioxide and Their Mixtures (book review), 169.

Wilson, P. W., Fred, E. B., and Salmon, M. R. Relation between carbon dioxide and elemental nitrogen assimilation in leguminous plants, 145–165.

Wilson, P. W., Wenck, P., and Peterson, W. H. A statistical study of nitrogen fixation by clover plants, 123–143.

Young, D. W. *See* **McHargue, J. S.**

Young, J. B. *See* **MacIntire, W. H.,** and Shaw, W. M.

SUBJECT INDEX

Acidity, *see* Soil acidity.
Agar cultures—
  for clover, 124.
  for legumes, 150.
Alfalfa—
  carbon-dioxide effect on nitrogen fixation by, 149.
  nitrogen fixation by, 149.
  response to phosphorus, 7.
Ammonia absorption—
  buckwheat, 473.
  oat plants, 380.
Ammonification, photochemical nature of, 284.
Ammonium sulfate, nitrification of, 488.
Apatite, phosphorus removal from, by electrodialysis, 3.
Aspergillus niger—
  age of spores affecting growth of, 262.
  method of measuring available potassium in soil, 259.
  mycellium, factors affecting weight of, 262.
Bacteria, root nodule, and leguminous plants, 167.
Barley—
  as affected by rye straw, 210.
  nitrogen in, 212.
Base Exchange—
  as affected by—
    calcium nitrate, 49.
    magnesium nitrate, 49.
    sodium nitrate, 49.
  in—
    cellulose, 234.
    hemicellulose, 234.
    lignin, 234.
    organic materials, 229.
Beets, nitrogen content of, 121.
Buckwheat, nitrogen absorption by, from culture solutions, 469.
Calcium, loss of, from soil, 254.
Caliche—
  effect on—
    plants, 105.
    water percolation, 101.
  relation of, to desert plants, 99–113.
Carbon Dioxide—
  assimilation as related to nitrogen assimilation by legumes, 145.
  diffusion through soils, 413–423.
  evolution, as affected by—
    nitrogen and crop residue additions, 345.
    oat straw, 489.
    timothy and clover, 348, 350.
Carbon-nitrogen ratio—
  as affected by—
    organic matter, 209.
    treatment, 341.
  in podzol profile, 318, 323, 325, 407–408.
Carrots, nitrogen content of, 121.
Celery, nitrogen content of, 121.
Cellulose—
  base-exchange in, 234.
  decomposition of, in soil, 488.
Chlorapatite, phosphorus removal from, by electrodialysis, 3.
Chloride—
  electrometric determination of, in soils, 43–48.
  organic matter effect on, determination, 47.
Clover—
  carbon-dioxide effect on nitrogen fixation by, 149.
  nitrogen fixation by, 123, 149.
  response to phosphorus, 8.
  roots of, analyses, 350.
  stubble, analyses of, 350.
Collinsite, phosphorus removal from, by electrodialysis, 3.
Colloids—
  composition of, soil, 325.
  distribution of, in soil profile, 324.
Collophanite, phosphorus removal from, by electrodialysis, 3.
Corn—
  as affected by rye straw, 211.
  nitrogen in, 212.
  response to phosphorus, 7.
  roots of, analyses, 350.
  stubble of, analyses, 350.
Cotton, response to phosphorus, 7.
Cowpeas, nematode infection in, 179.

Crop response to fertilization, 1.
Culture solutions—
effect on—
growth of plants, 355.
nitrogen fraction of plants, 355.
nitrogen absorption by oats from, 375.
osmotic proportions of, and nitrogen in plants, 367.
Dried blood, nitrification of, 488.
Dufrenite, phosphorus removal from, by electrodialysis, 3.
Electrodes—
quinhydrone, preparation of, 44.
silver-silver chloride, for determination of chloride, 43.
Electrodialysis method for determining soluble phosphorus in soil, 1.
Fertilizers—
crop production and (book review), 171.
for vegetables, 118.
phosphorus assimilation, as affected by, 200.
plant and soil response to (book review), 171.
potassium assimilation, as affected by, 202.
Forest—
brown soils, phosphate distribution in, 463.
floor under stands of aspen and paper birch, 307–312.
humus, effect on revegetation, 67.
leaves, acidity of, 68.
liter, effect on revegetation, 67.
needles, acidity of, 68.
soil, acidity of, 57.
Hemicellulose, base exchange in, 234.
Heterodera, *see* Nematode.
Humification, degree of, in manure, 221–228.
Humus, forest, effect on revegetation, 67.
Hydrogen-ion concentration—
effect on infection by Heterodera radicicola (nematodes), 175.
of—
first 6 inches of forest soil, 309.
forest floor, 309.
soil leachings, 249.
practical application of, (book review), 172.
Hydrogen-peroxide method for determining the degree of humification, 221.
Iodine—
content of the soil in Kentucky, 425.
method of determining, 426.
Iron—
separation of, by an electrolytic cell, 93.
solubility of, at various pH, 15.
Land Drainage (book review), 170.
Legumes—*see* also Plants and Nodule bacteria
carbon-dioxide and nitrogen assimilation by, 145.
effect on microbiological activities, 485–491.
Lettuce, nitrogen content of, 121.
Lignin, base exchange in, 234.
Lysimeter—
calcium outgo, 51.
leachings—
bases released in, 247.
chlorine in, 247.
conductivity of, 239.
from, 50.
loss on ignition of solids from, 246.
reaction of, 239.
solids in, 246.
sulfur in, 247.
magnesium outgo, 51.
potassium outgo, 52.
sodium outgo, 52.
studies, 239–257, 401–411.
Magnesium, loss of, from soil, 254.
Manure, artificial, from straw and various nitrogen sources, 224–225.
Microbiological activities in the soil, as affected by legumes, 485.
Mitscherlich method for determining available potash, 274.
Moisture—
capacity of mineral soils and the cations, (book review), 173.
equivalent in organic matter of forest floor, 309.
soil, effect on availability of nutrients to the tomato plant, 295.
Nematode—
galls on pineapple roots, 29.
infection, as affected by hydrogen-ion concentration of soil, 175–184.
population in soil, 39.
root knot, in soils, 185.
Neubauer—
method for determining available potash, 273.
procedure, plants grown according to, 197.

Nitrate—
availability of, as affected by soil moisture, 295.
formation in soil, as affected by organic matter, 209.
nitrogen—
absorption—
buckwheat, 473.
oats, 380.
as affected by organic matter, 121.
Nitrates, as affected by—
crop residues, 335.
rye straw, 217.
Nitrification—
cellulose decomposition and, 485.
of dried blood, 488.
organic matter, in soil taken from field, 487.
photonitrification in soil, 281.
Nitrogen—
absorption from culture solutions, 375–399, 469–483.
assimilation by legumes as related to CO_2 assimilation, 145.
fixation—
as affected by legumes and non-legumes, 489.
by clover, 123–143.
fixed (book review), 168.
in—
barley, 212.
beets, 121.
carrots, 121.
celery, 121.
corn, 212.
lettuce, 121.
oats, 212.
onions, 121.
organic matter of forest floor, 309.
soybeans, 212.
spinach, 121.
method of analyses of, fraction in plants, 358.
movement in soil profile, 401.
organic, in plants, 368–372.
statistical methods for studying, fixation, 123.
Nodule Bacteria and Leguminous Plants (book review), 167.
Oats—
ammonia absorption by, from solution, 380.
as affected by rye straw, 210.
Oats—(*continued*)
growth of, in culture solution, 355.
nitrate absorption by, from solution, 380.
nitrogen in, 212, 355.
response to P, 8.
Onions, nitrogen content of, 121.
Organic materials, base exchange in, 229–237.
Organic matter—
acidity of, 309.
determination of, in humification experiments, 222.
effect on—
carbon-nitrogen ratio, 209.
crop yield, 209.
nitrate formation in soil, 209.
nitrate nitrogen, 121.
enrichment of the B horizon with, 409.
in soil treated with straw, 215.
lime in, 309.
moisture equivalent in, 309.
movement of, in soil profile, 401.
nitrification of, as taken from the field, 487.
nitrogen in, 308.
of forest floor, 308.
Phosphate—
available—
as affected by soil moisture, 295.
in soil, 17–27.
extraction of, by various methods, 24, 437.
readily soluble, extraction with $KHSO_4$, 437.
rock, dissolution rate in a $KHSO_4$ solution, 449.
soluble, in soil, 22.
vertical distribution of soluble phosphates in soils, 459.
Phosphorus—*see* also Phosphate.
assimilation, as affected by—
fertilizer additions, 200.
lining, 200.
assimilation of, by barley, 197.
Beer's law and the colorimetric method for determining, in the soil, 88, 90.
citric acid extract of soils, colorimetric method, 85–97.
methods for determining, 1, 2, 85.
soluble—
in soil and crop response, 1.
methods for determining, 1, 2, 13.
Zinzadze method for determining, 93.
Phytopedological factor, soil acidity as a, 55–72.

Pineapple—
life duration of nematodes in, roots, 193.
nematode galls on, 32.
nematode infection in, 180.
Plants—
absorption of magnesium by, 110.
absorption of calcium by, 110.
agar cultures for clover, 124.
ammonia—
absorption by oat, 380.
nitrogen in, 362.
desert, relation to caliche, 99.
leguminous, carbon dioxide and nitrogen assimilation by, 145–165.
nitrate—
absorption by oat, 380.
in, as affected by moisture, 300.
nitrogen in, 362.
phosphate in, as affected by moisture, 301.
potassium content of, 203, 303.
sand cultures for clover, 124.
soluble nitrogen in, 365.
Podzol, phosphate distribution in a, soil, 461.
Podzols, distribution of—
calcium, 317.
magnesium, 317.
nitrogen, 317.
organic matter, 317.
potassium, 317.
sesquioxide, 316.
silica in, 315.
Potassium—
assimilation, as affected by—
fertilizer additions, 202.
liming, 202.
assimilation of, by barley, 197.
available—
as affected by soil moisture, 295.
in soil as determined by the A. niger method, 259.
methods for determining, 270.
content of plants, 203.
Quercyite, phosphorus removal from, by electrodialysis, 3.
Rock phosphate, *see* Phosphate.
Roots—
analyses of, 350.
method of determining weight of, 337.
Silica, loss of, from soil, 254.
Soil—
acidity—
as a phytopedological factor, 55–72.
methods of determining, 56.
relation to forest associations, 57.
Soil—(*continued*)
aggregates, dispersion of, 291–294.
analyses, value of, 328.
base exchange in a 6-foot, column, 49.
calcium, *see* Calcium.
carbon, as affected by rye straw addition, 213.
colloids—*see* also Colloids.
composition of, 325.
distribution of, in profile, 324.
silica-sesquioxide ratio in, 325.
cultures, method of preparing, 338.
forest, acidity of, 57; *see* also Forest.
garden, readily soluble phosphates in, 445.
horizon A_0, acidity of, 69–70.
horizon A_1—
conductivity and reaction of leachings from, 239.
movement of constituents through, 243.
nitrogen percolation through, 403.
organic matter percolation through, 407.
silica and sesquioxides in leachings from, 249.
horizon, A_2—
conductivity and reaction of leachings from, 243.
movement of constituents through, 249.
nitrogen percolation through, 405.
organic matter percolation through, 408.
horizon B—
acidity of, 69–70.
conductivity and reaction of leachings from, 243.
enrichment of, with organic matter, 409.
nitrates in, 410.
horizon C—
conductivity and reaction of leachings from, 243.
nitrates in, 410.
phosphates extracted from, with $KHSO_4$, 452.
hydrogen-ion concentration—
as affected by rye straw additions, 216.
effect on—
nematode infection, 175; *see* also Hydrogen-ion concentration.
iodine content of the, in Kentucky, 425–435.
leachings—
bases in, 247.
conductivity of, 239.
reaction of, 239.
sesquioxides in, 249.
silica in, 249.

Soil—
leachings—(*continued*)
solids in, 246.
sulfur in, 247.
loss on ignition, 215.
losses through leaching, 254.
magnesium, *see* Magnesium.
methods for the study of, 169.
microbiological activities in, 485.
moisture—*see* also Moisture.
effect on availability of nitrate, phosphate, potassium and to the tomato, 295–305.
method of maintaining the, 296.
Neubauer procedure, growing plants by, and in undiluted, 197.
nitrate formation, as affected by organic matter, 209; *see* also Nitrate, Nitrates.
nitrates, as affected by—
crop residues, 335–354.
dried blood, 344.
maize residues, 343.
maize roots, 344.
rye straw, 217.
water extracts from crop residues, 346.
nitrogen, as affected by rye straw additions, 213; *see* also Nitrogen.
phosphate—*see* also Phosphate
apparatus for percolation to determine available, 20.
available, in, 17.
extraction method, 18.
percolation method, 19.
phosphorus—*see* also Phosphorus, Phosphate.
content of, in relation to crop response by fertilization, 1–16.
method of extracting soluble, 437.
relation between, and removal by plants, 201.
solubility in 0.1 *N* H_2SO_4, 201.
photonitrification in, 281–284.
podzol, *see* Podzols, Podzol.
podzolic, movement of nitrogen and organic constituents in, profile, 401.
potassium—*see* also Potassium.
Aspergillus niger method for measuring available, 259–279.
relation between the, supply and removal by plants, 204.
profile—
base-exchange in, 320, 324, 325.
carbon-nitrogen ratio in, 318, 323.
chemical characteristics of, 315, 322.
Soil—
profile—(*continued*)
colloid fraction in, 324.
morphological features of, 314, 321.
movement of constituents in the, 239–257.
percolation of nitrogen through, 401.
studies, 313–331.
unsaturation in, 320, 324.
profile, distribution of—
bases, 317, 323.
nitrogen, 317.
organic matter, 317, 323, 401.
phosphates, 459.
sesquioxides, 316, 322.
silica, 316, 322.
solid phase of, solubility in water, 75–83.
temperature installation, 285–289.
treatment, effect on potassium content of plants, 203.
types, solubility of the complex in various, 78–79.
water, as affected by caliche, 101.
Soils—
brown forest, phosphate distribution in, 463.
carbon dioxide diffusion through, 413.
chlorides, determination of, in, 43.
crop residues in, 339.
methods for the study of (book review), 169.
moisture capacity of, and cations, 173.
nematodes in, subjected to drying, 185–195.
origin, constitution and classification (book review), 171.
phosphates readily soluble in, 437.
podzol, *see* Podzols, Podzol.
vertical distribution of soluble phosphates in Ontario, 459–468.
Soybeans—
as affected by rye straw, 210.
nitrogen in, 212.
response to phosphorus, 8.
Spinach, nitrogen content of, 121.
Statistical methods in studying nitrogen fixation, 123.
Straw—
and nitrogen sources for artificial manure, 225.
oat, effect on yield of vegetables, 115.
rye, effect on—
soybeans, barley, and oats, 210.
yield of vegetables, 115.

Stubble—
analyses of, 350.
method of determining weight of, 337.
Subsoil—
base exchange in, 49.
soluble phosphate in, 441, 444.
Sulfur, loss of, from soil, 254.
Timothy—
roots, analyses of, 350.
stubble, analyses of, 350.
Titanium, effect on colorimetric determination of phosphorus, 87.
Tomato plants, effect of moisture on intake of nutrients by, 295.
Triplite, phosphorus removal from, by electrodialysis, 3.
Variscite, phosphorus removal from, by electrodialysis, 3.
Vegetables, influence of rye and oat straw on, 115–122.
Vivianite, phosphorus removal from, by electrodialysis, 3.
Water, geology and, resources of Northwestern Minnesota (book review), 173.
Wavellite, phosphorus removal, by electrodialysis, 3.
Wheat, response to phosphorus, 9.